

APPLICATION  
FOR  
UNITED STATES OF AMERICA

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SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

Be it known that I,

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have invented certain improvements in

“LIFT FOR VEHICLES”

of which the following description in connection with the accompanying drawings is a specification, like reference characters on the drawings indicating like parts in the several figures.

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## BACKGROUND OF THE INVENTION

The present invention relates to a lift for vehicles.

Lifts for vehicle substantially comprising two parallel ramps on which the vehicles are positioned for being lifted, inspected and to perform  
5 maintenance have long been used in garages.

According to their structure, the auto lifts or hoists are divided into two main categories: in a first oldest one, the ramps are associated and moved vertically by sliding on four posts; in a second more recent one, each ramp has its own lifting frame of the so-called scissor-like type, and such frames  
10 are circuitally or mechanically interconnected so as to move in step, maintaining the parallel arrangement of the ramps.

The first type of lift is substantially sturdier and more stable when loaded but is less practical in use and has a greater overall space occupation.

The posts, which are fixed, limit operator access to the vehicle in the  
15 regions where the posts are present, and even when the lift is not loaded and is not in use they obstruct the passage of vehicles during movement within the garages in which the lifts are placed.

The second type of lift is less awkward to use and is far more compact than the preceding one, but this is achieved at the cost of generally lower  
20 stability when loaded.

The complete absence of supporting posts allows operators to access without problems all the regions of the vehicle placed on the ramps, and when the lifts are not loaded they can rest on the ground so that they are lowered practically retractably into the floor surface; in this way they do not  
25 constitute a hindrance for the movements of the vehicles inside garages, since they can be passed over easily and without danger of interference.

Another need which is felt particularly strongly by users of both kinds of the lifts described above is to have resting areas which are safe and stable in their positioning and on which the conventional instruments for reading and  
30 precision measurement of vehicle wheel angle parameters, such as toe-ins,

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camber angles and others, can be placed.

### SUMMARY OF THE INVENTION

The aim of the present invention is to eliminate the above-noted drawbacks of the prior art by providing a lift for vehicles whose structure is  
5 sturdy and stable when loaded.

Within the scope of this aim, an object of the present invention is to provide a lift for vehicles which allows full access to the vehicle, maintaining a small space occupation and a structure which does not hinder to an unsurmountable extent the possibility to move the vehicles inside the  
10 garages.

Another object of the present invention is to provide operators with a lift for vehicles which has adequate supports for the stable and safe resting of precision instruments normally used for measurements and corrections of the trim of vehicles.

15 This aim and these and other objects which will become better apparent hereinafter, are achieved by a lift for vehicles, comprising two parallel ramps for loading the vehicles which can be actuated so as to move vertically, characterized in that said two ramps have concurrent ends being rigidly coupled to the cross-member of a portal-like frame, said cross-member being  
20 actuatable with a vertical translational motion parallel to itself by way of corresponding means along a pair of posts, corresponding grid-like frames, with rods hinged in a scissor-like fashion for the constant resting of the ramps on a floor surface, being provided below each ramp.

### BRIEF DESCRIPTION OF THE DRAWINGS

25 Further characteristics and advantages of the present invention will become better apparent from the description of a preferred embodiment of a lift for vehicles, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a perspective view of the lift for vehicles according to the  
30 invention, provided with a secondary frame for supporting instrument-

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carrying platforms which is associated with the posts;

Figure 2 is another perspective view of a second embodiment of the lift for vehicles according to the invention, in which the secondary frame for supporting instrument-carrying platforms is associated with the movable cross-member of the portal-like frame;

Figure 3 is a perspective view of the lift for vehicles shown in Figure 2, in which the vehicle access ramps are provided with pull-out stands;

Figure 4 is a perspective view, in phantom lines, of a possible but not exclusive embodiment of the means for the vertical actuation of the ramps.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to the figures, 1 designates a lift for vehicles comprising two parallel ramps 2 onto which the vehicles are loaded and which can be actuated so as to move vertically.

The two ramps 2 have, for this purpose, two corresponding ends which are rigidly coupled to the cross-member 3a of a portal-like frame 3; the cross-member 3a can be actuated with a vertical translational motion parallel to itself by way of corresponding conventional means, constituted for example, as shown in Figure 4, by a hydraulic or pneumatic actuator 4 which acts by pulling two cable-like traction elements 6 whose respective ends 6a and 6b are rigidly coupled to the end of the stem 4a of said actuator and, after passing around a series of guide pulleys 6c, to a pair of posts 5 which compose the frame 3 and along which, as mentioned, the cross-member 3a is movable.

In the lower parts of each ramp 2 corresponding grid-like frames 7 are provided which are composed of rods 7a being pivoted in a scissor-like fashion for the constant resting of the ramps 2 on a lower supporting surface P, which in the specific case is the floor.

The corresponding lower ends of the rods 7a that are directed towards the portal-like frame 3 are articulated in a hinge-like fashion, i.e. with a single degree of freedom, while the opposite ends can slide in or on guides 8 which

are substantially horizontal and in the specific case are fixed to said surface P.

On the opposite side of the concurrent ends of the ramps 2 with respect to the portal-like frame 3 a secondary frame 9 is provided for supporting  
5 platforms 10 provided for resting instruments for performing diagnostics on vehicles and particularly for checking their trim.

The secondary frame 9 can be rigidly fixed to the posts 5 and to the cross-member 3a, and in the latter case can follow its vertical movements: moreover, said secondary frame is of the tubular type and is shaped so as to  
10 form two arms 11 for fixing, as mentioned, both to the cross-member 3a and to the posts 5, and a cross-member 12 for supporting the resting platforms 10.

The ramps 2 can be provided with supplemental stands 13 which can be pulled out for use or accommodated retractably in each ramp when not in  
15 use.

Operation of the invention can be clearly deduced from the above description: a vehicle is placed on the ramps 2 of the lift 1 to be subjected to diagnostic tests by one or more assigned operators.

The extension of the stem 4a of the actuator 4 generates on the cable-like  
20 traction elements 6 the action for lifting the cross-member 3a, which moves with it the ramps 2 and the vehicle arranged thereon.

Beforehand, the operator places the diagnostic instruments, mainly for diagnosing the trim of the vehicle, on the platforms 10, adjusting their alignments on the parts being tested.

Depending on the structure of the instruments and on their consequent  
25 operation, the lift 1 can be provided with a secondary frame 9 for supporting the platforms 10 which is rigidly coupled to the posts 5, and is therefore fixed with respect to the vertical movements of the vehicle, or is rigidly coupled to the cross-member 3a and therefore movable synchronously  
30 therewith.

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During the upward translational motions of the ramps 2, the frames 7 provide said ramps with constant support on a surface P, usually constituted by the floor or, as shown in Figure 2, by suitably provided pits formed in the floor for the retraction of said ramps 2 when they are moved to the fully lowered position.

The rotation of the rods 7a and the sliding of their lower ends in the guides 8 allow to follow automatically the movements of the ramps 2, maintaining a constant resting on the surface P and therefore a safe support of the ramps.

When the vehicle is raised, the operator can move around it practically without hindrance and can perform any inspection or intervention that is required in maximum comfort.

When the lift 1 is not in use, the ramps 2, as mentioned, can be lowered so as to retract into suitably provided pits formed in the floor P, or rest on it; in both cases, vehicles can still pass over it, allowing maximum mobility inside the garages in which the lift 1 is installed.

Finally, if necessary the ramps 2 can be equipped with supplemental stands 13 for lifting the body of the vehicles so as to take the load off the wheels.

In practice it has been found that the described invention achieves the intended aim and objects.

The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

All the details may further be replaced with other technically equivalent ones.

In practice, the materials used, as well as the shapes and the dimensions, may be any according to requirements without thereby abandoning the scope of the protection of the appended claims.

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